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EXAMINER
LONG, HEATHER R

ART UNIT	PAPER NUMBER
2615	7

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/584,198	HASHIMOTO ET AL.	
	Examiner	Art Unit	
	Heather R Long	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *4 and 24-30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 May 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's election with traverse of an image pickup apparatus comprising an addition means in Paper No. 6 is acknowledged. The traversal is on the ground(s) that the subject matters of all species are sufficiently related and that a thorough search for the subject matter of any one species would encompass a search for the subject matter of the remaining species.

However, the applicant is reminded that upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

The requirement is still deemed proper and is therefore made FINAL.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: Fig. 43, reference characters "427", "431", and "421".

3. The drawings are objected to because in Figs. 11, 23, 24 reference sign "ΦTadd" should be – Φadd--.

A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

5. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are:

a. Page 52, line 2: "MR11 + MR12 + MB21" should be --MB11 + MB12 + MG21".

b. Page 52, lines 2 and 3: "upper" and "lower" need to be switched.

Examiner notes that these are just two of the numerous errors found throughout the specification.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1, 2, 6-10 and 12

7. Claims are rejected under 35 U.S.C. 102(b) as being anticipated by Adams, Jr. et al. (U.S. Patent 5,506,619).

Regarding claim **1**, Adams, Jr. et al. discloses an image pickup apparatus comprising: a plurality of pixels arranged in a matrix form; means for adding together, in the oblique direction, at least two pixel signals that output a first color signal; means for adding together, in the horizontal direction, at least two pixel signals that output a second color signal; and means for adding together, in the horizontal direction, at least two pixel signals that output a third color signal (col. 5, lines 18-30; EQ. 14, 18, and 20; col. 6, lines 30-32).

Regarding claim **2**, Adams, Jr. et al. discloses an image pickup apparatus wherein the first color signal is a G (green) signal, and the second and third signals are R (red) and B (blue) signals (col. 5, lines 18-30; EQ. 14, 18, and 20; col. 6, lines 30-32).

Regarding claim **6**, Adams, Jr. et al. discloses an image pickup apparatus comprising: a plurality of pixels arranged two-dimensionally; and addition means for adding together signals produced by pixels that output the same color signal, wherein the addition means performs addition in such a manner that a line

interval between pixels that output a first color signals and used for addition of the first color signals, is smaller than a line interval between pixels that output a second and third color signals and used for the addition of the second and the third color signals (col. 5, lines 18-30; EQ. 15, 18, and 20; col. 6, lines 30-32).

Regarding claim **7**, Adams Jr. et al. discloses an image pickup apparatus wherein the addition means adds, between adjacent lines, the signals of the pixels that output the first color signal, and adds, between every other line, the signals for the pixels that output the second and the third color signals (col. 5, lines 18-30; EQ. 15, 18, and 20; col. 6, lines 30-32).

Regarding claim **8**, Adams Jr. et al. discloses an image pickup apparatus wherein the first color is a G (green) signal, and the second and the third signals are R (red) and B (blue) signals (col. 5, lines 18-30; EQ. 15, 18, and 20; col. 6, lines 30-32).

Regarding claim **9**, Adams Jr. et al. discloses an image pickup apparatus wherein the addition means adds signals of pixels each having the first color filter, which are positioned in an oblique direction, and adds signals of pixels having the second and the third color filters, which are positioned in horizontal and vertical directions (col. 5, lines 18-30; EQ. 14, 15, 18, and 20; col. 6, lines 30-32).

Regarding claim **10**, Adams Jr. et al. discloses an image pickup apparatus wherein the addition means changes a line used for addition on a line basis (col. 5, lines 18-30; EQ. 14, 15, 18, and 20; col. 6, lines 30-32). In order to add colors

obliquely or vertically the addition means need to go to the next line or the adjacent line for a color corresponding to the original color.

Regarding claim **12**, Adams Jr. et al. discloses an image pickup apparatus wherein a high luminance signal is formed by using the signals from the pixels that output the first color signal (col. 4, lines 15-22).

8. Claim 5 is rejected under 35 U.S.C. 102(b) as being anticipated by Parulski et al. (U.S. Patent 5,828,406).

Regarding claim **5**, Parulski et al. discloses in Figs. 3B and 4 an image pickup apparatus comprising: a plurality of pixels arranged two-dimensionally; first (76) and second (78) horizontal output lines that are vertically arranged and oriented differently; and reading means for adding together signals produced by the plurality of pixels that output the first horizontal output line (76), and for adding together signals produced by the plurality of pixels that output the second color signal and reading out the result from the second horizontal output line (78) (col. 8, lines 16-43).

9. Claims 13-15, 17-21 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Acharya et al. (U.S. Patent 6,236,433).

Regarding claim **13**, Acharya et al. discloses an image pickup apparatus comprising: a pixel portion in which are arranged a plurality of pixel elements, each of which consists of a plurality of pixels arranged according to a predetermined basic color arrangement; and reading means for reading signals of a plurality of colors form the pixel elements, and for adding and scanning, on a

same color basis, a signal from the same pixel elements and/or signals from different pixel elements, wherein the reading means adds the signals from the plurality of pixels so that a spatial color arrangement for each color before addition is the same as a spatial color arrangement for each color after addition (Fig. 2; col. 3, line 65 – col. 4, line 5; col. 5, line 43 – col. 6, line 23).

Regarding claim **14**, Acharya et al. discloses an image pickup comprising: a pixel portion in which are arranged a plurality of pixel elements that consist of a plurality of pixels arranged according to a predetermined basic color arrangement; and reading means for adding and scanning signals of the plurality of pixels, and for reading signals of a plurality of colors, wherein the reading means adds together a plurality of pixel signals so that a spatial color arrangement for each color before addition is the same as a spatial color arrangement for each color after addition, and wherein at least one of the plurality of colors is provided by a color signal obtained by adding together signals produced only by pixels that are arranged in an oblique direction (Fig. 2; col. 3, line 65 – col. 4, line 5; col. 5, line 43 – col. 6, line 23; col. 8, lines 37-39).

Regarding claim **15**, Acharya et al. discloses in Fig. 2 an image pickup apparatus wherein the reading means performs thinning-out scanning of a plurality of pixels signals (col. 8, lines 42-58).

Regarding claim **17**, Acharya et al. discloses an image pickup apparatus wherein the pluralities of colors are for G (green), R (red), and B (blue) (Fig. 2; col. 3, line 65 – col. 4, line 5).

Regarding claim **18**, Acharya et al. discloses an image pickup apparatus wherein the reading means adds signals of pixels adjacent to each other in an oblique direction, which output a first color signal, and adds signals pixels adjacent to each other in horizontal and vertical directions, which output second and third color signals (Fig. 2; col. 7, lines 23-27 and 64-65; col. 8, lines 37-39).

Regarding claim **19**, Acharya et al. discloses an image pickup apparatus comprising: a plurality of pixels arranged two-dimensionally; and addition means for adding together signals form pixels that output a same color signal, wherein the addition means performs addition in such a manner that an area used for obtaining addition signals are spatially overlapping each other (Fig. 2; col. 3, line 65 – col. 4, line 5; col. 5, line 43 – col. 6, line 23; col. 7, lines 23-27 and 64-65; col. 8, lines 37-39).

Regarding claim **20**, Acharya et al. discloses an image pickup apparatus wherein addition of signals from pixels that output the same color is performed vertically and horizontally in a pixel arrangement (Fig. 2; col. 7, lines 23-27 and 64-65; col. 8, lines 37-39).

Regarding claim **21**, Acharya et al. discloses an image pickup apparatus wherein the individual colors are for R (red), G (green), and B (blue) (Fig. 2; col. 3, line 65 – col. 4, line 5).

Regarding claim **23**, Acharya et al. discloses an image pickup apparatus wherein the addition means adds a plurality of pixel signals so that a spatial color arrangement for individual colors before addition has been performed is the

same as a spatial color arrangement for the colors after addition has been performed (Fig. 2; col. 5, line 43 – col. 6, line 23).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams Jr. et al. as applied to claims 1 and 6 above.

Regarding claim **3**, claim 3 differs from Adams Jr. et al. in that claim 3 further requires the image pickup apparatus to comprise a switching means for switching between means independently reading the pixel signals and means for adding and reading the pixel signals for each color. Although, Adams Jr. et al. fails to explicitly show the switching means, one of ordinary skill in the art would know a switching means would be provided in this circuit determining whether or not to interpolate the image depending on the desired quality of the image.

Regarding claim **11**, grounds for rejecting claim 3 apply to claim 11 in its entirety.

12. Claims 16 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya et al. as applied to claims 13 and 19 above.

Regarding claim **16**, claim 16 differs from Acharya et al. in that claim 16 further requires an image pickup apparatus comprising a switching means for switching between a first reading mode for performing the adding and scanning to read signals, and a second reading mode for reading signals of all pixels.

Although, Acharya et al. fails to explicitly show the switching means, one of ordinary skill in the art would know a switching means would be provided in this circuit determining whether or not to scale the image along with determining color interpolation/recovery depending on the input from the user.

Regarding claim **22**, Acharya et al. differs from claim 22 in that claim 22 further requires the image pickup apparatus where the individual colors are Ye (yellow), Cy (cyan), Mg (magenta), and G (green). Acharya et al. states their technique described in Fig. 1 is applicable specifically to an image in its CFA (Color Filter Array) form, as derived for instance, from an image sensor or set of image sensors. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a color filter with Ye (yellow), Cy (cyan), Mg (magenta), and G (green) instead of a Bayer pattern filter.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Yamada et al. (U.S. Patent 6,690,421) discloses a solid state image pickup device comprising: a plurality of pixels arranged two-dimensionally; and first and second horizontal output lines that are vertically arranged and oriented differently.

b. Hirota (JP 2001156281) discloses an image pickup apparatus wherein the signal charge of the vertical two pixels and the signal charge of oblique two pixels of the vertical CCDs are added together.

c. Yamazaki (U.S. Patent 6,275,261) discloses an image sensing device whose operation uses eight operation signals and a two-step process that is performed repetitively to obtain one image frame. The first step in the process adds the image signals associated with two adjoining rows in the vertical direction, skips a predetermined number of rows of pixels, and outputs the resultant image signals. The second step in the process adds two adjoining rows in the oblique direction, skips a predetermined number of rows of pixels, and outputs the resultant image signals.

d. Wakagi (JP 2000308074) discloses a solution to improve the resolution of an image pickup element not only in the horizontal and vertical directions but also in oblique directions and, at the same time, to enable the element to suppress false color signals.

e. Yanai et al. (U.S. Patent Application Publication 2002/0057354) discloses an image pickup device wherein by combining a method of adding the signal charges in the vertical and diagonal directions and a method of further adding a

signal charge in the vertical direction to the signal charges, added in the vertical direction in the above-mentioned manner, an image signal corresponding to such added signal charges is outputted from the output unit.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heather R Long whose telephone number is 703-305-0681. The examiner can normally be reached on Mon. - Thurs.: 7:00 am - 4:30 pm, and every other Fri.: 7:00 am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on (703) 308-9644. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HRL
April 27, 2004

NGOC-YEN VU
PRIMARY EXAMINER